ABSTRACT OF THE DISCLOSURE

Two motors are arranged on opposing sides of a common shaft, drive plates of the pump/motors being rigidly coupled to each other, for example by being in hard contact with opposing sides of the shaft. By providing hard contact between the pump/motor drive plates and a common shaft, the drive plates and shaft act as a substantially solid element under compression, thereby substantially canceling axial loads generated by the pump/motors directly through the shaft. Residual axial loads are handled via bearings positioned on the shaft adjacent the drive plates in such a manner that the drive plates are in light contact only with the bearings. As a result, friction experienced by the bearings is substantially reduced as compared to conventional systems, thereby improving the efficiency of the system. To further reduce loads on the bearings, the pump/motors are arranged to ensure that they generate radial forces in a direction that is opposite to that of a separation force generated by a torque transferring device carried on the shaft and transmitted to the bearings. A common housing surrounding the two pump/motors, bearings and torque transferring device is divided into three regions, to segregate the bearings and torque transferring assembly from the pump/motors. In this manner, the regions containing the pump/motors are substantially filled with oil to, for example, fully lubricate the pump/motors, while the central region containing the gears and torque transferring device contains a significantly smaller volume of oil to simply splash lubricate the contents of the region, thereby reducing drag on the bearings. Control means are provided for selectively moving the two pump/motors substantially simultaneously to a selected displacement angle, using mechanical systems alone and in combination with hydraulic systems.